

REMARKS/ARGUMENTS

Reconsideration of the above-identified application in view of the present amendment is respectfully requested. By the present amendment, claims 1, 12, and 19 have been amended to include the limitation that the thermoplastic polyolefin elastomer is weatherable and has a durometer shore A hardness of about 30 to about 90. Claims 2 and 13, which depend respectively from claims 1 and 12 have been cancelled.

Below is a discussion of the 35 U.S.C. §102(e) and the 35 U.S.C. § 103 rejections presented herein in the order that they are presented in the Office Action.

35 U.S.C. §102(e) rejection of claims 1, 3-4, 7, 8, 11-13, 15, 18-22, 24, 27, and 28

Claims 1, 3-4, 7, 8, 11-13, 15, 18-22, 24, 27, and 28 were rejected under 35 U.S.C. §102(e) as being anticipated by Reidy et al.

Claim 1 recites a steering wheel comprising a rim portion, a spoke portion, and a foamed padding material adhered to at least one of the rim portion and the spoke portion. The foamed padding material includes a first portion and second portion. The first portion has a cellular structure and a substantially uniform cell density. The second portion has a continuous external surface free of interruption by cell. The foamed padding material comprises a gasified chemical foaming agent and a thermoplastic polyolefin elastomer. The thermoplastic polyolefin elastomer is weatherable and has a durometer shore A hardness of about 30 to about 90.

Claim 1 is patentable over Reidy et al. because Reidy et al. do not teach a padding material comprising a thermoplastic polyolefin elastomer, wherein the thermoplastic polyolefin elastomer is weatherable and has a durometer shore A hardness of about 30 to about 90.

As noted in the Office Action, Reidy et al. teach a padding material comprising a thermoplastic elastomer. Reidy et al. teach that the thermoplastic elastomer can be Arnitel EM 400. As discussed in the background section of the present application and in the Arnitel reference provided in the IDS, Arnitel EM 400 is not a polyolefin thermoplastic elastomer, but a polyester. Reidy et al. teaches that the durometer Shore A hardness of EM 400 can be about 91.9 to about 93.1. Thus, Reidy et al. teaches that Arnitel EM 400 can have a durometer Shore A hardness of about 91.9 to about 93.1, but as noted earlier Arnitel EM 400 is not a thermoplastic polyolefin elastomer.

Reidy et al. also teach that thermoplastic elastomers, such as polypropylene can be used for the steering wheel. Reidy et al. however, do not teach that the durometer shore A hardness of a thermoplastic elastomer formed from polypropylene. Additionally, there is no suggestion in Reidy et al. that a thermoplastic elastomer formed from a polypropylene has a durometer Shore A hardness of about 30 to about 90. Thus, Reidy et

al. fail to teach a thermoplastic polyolefin elastomer with a durometer Shore A hardness of about 30 to about 90; therefore, withdrawal of this rejection is respectfully requested.

Claims 3-4, 7, 8, and 11 depend either directly or indirectly from claim 1 and therefore should be allowable because of the aforementioned deficiencies of the rejection with respect to claim 1 and for the specific limitations recited in claims 2-4, 7, 8, and 11.

Claim 12 includes limitations similar to claim 1 and therefore should be allowable because of the aforementioned deficiencies of the rejection with respect to claim 1 and for the specific limitations recited in claim 12.

Claims 13, 15, and 18 depend either directly or indirectly from claim 12 and therefore should be allowable because of the aforementioned deficiencies of the rejection with respect to claim 12 and for the specific limitations recited in claims 13, 15, and 18.

Claim 19 includes limitations similar to claim 1 and therefore should be allowable because of the aforementioned deficiencies of the rejection with respect to claim 1 and for the specific limitations recited in claim 19.

Claims 20-22, 24, 27, and 28 depend either directly or indirectly from claim 19 and therefore should be allowable because of the aforementioned deficiencies of the rejection with respect to claim 19 and for the specific limitations recited in claims 20-22, 24, 27, and 28.

35 U.S.C. §103(a) rejection of claims 5, 6, 13, 14, 22, and 23

Claims 5, 6, 13, 14, 22, and 23 were rejected under 35 U.S.C. §103(a) as being unpatentable over Reidy et al. in view of Oseroff et al. The Office Action argues that Reidy et al. teach the claimed invention except the thermoplastic composition of the steering wheel and that Oseroff et al. teach it is known in the art to provide a steering structure with a foamed padding material comprising polypropylene and EPM or EPDM.

Claims 5, 6, 13, 14, 22, and 23 are patentable over Reidy et al. in view of Oseroff et al. because Reidy et al. in view Oseroff et al. do not teach or suggest using a thermoplastic polyolefin elastomer and a gasified chemical foaming agent, wherein the thermoplastic polyolefin elastomer is weatherable and has a durometer shore A hardness of about 30 to about 90 agent in a padding material for a steering wheel such that the padding material has a first portion having a cellular structure and a substantially uniform cell density and a second portion having a continuous external surface free of interruption by a cell.

As discussed above with respect to claim 1, Reidy et al. do not teach or suggest a padding material for a steering wheel comprising a thermoplastic polyolefin elastomer and a gasified chemical foaming agent, wherein the thermoplastic polyolefin elastomer is weatherable and has a durometer shore A hardness of about 30 to about 90. Reidy et al.

only teach a foamed polyester thermoplastic elastomer with a durometer shore A hardness of about 91, not a foamed thermoplastic polyolefin elastomer with a durometer shore A hardness of about 30 to about 90.

Oseroff et al. teach thermoplastic rubbers that can be used for grips or tapes, which are wound around steering wheels. The thermoplastic rubbers in Oseroff et al. can include polyolefins. Oseroff et al. further teach that the grips or tapes can be foamed and that the thermoplastic rubbers can have a durometer Shore A hardness of about 35 to about 65.

Oseroff et al., however, do not teach that the thermoplastic rubbers can have a first portion having a cellular structure and a substantially uniform cell density and a second portion having a continuous external surface free of interruption by a cell. Moreover, Oseroff et al. do not teach that these thermoplastic rubbers are suitable for use in an injection molded steering wheel as taught in Reidy et al.

Thus, Reidy et al. in view of Oseroff et al. do not teach or suggest a padding material adhered to a steering wheel comprising a thermoplastic polyolefin elastomer and a gasified chemical foaming agent, wherein the thermoplastic polyolefin elastomer is weatherable and has a durometer shore A hardness of about 30 to about 90 agent and that the padding material has a first portion having a cellular structure and a substantially uniform cell density and a second portion having a continuous external surface free of interruption by a cell.

The Office Action argues that it would be obvious to one of ordinary skill in the art to modify the foamed padding of Reidy et al. with the teachings of Oseroff et al. since Oseroff et al. teach using a blend of elastomers for a steering wheel and Reidy et al. teach that other thermoplastic elastomers may be used in foamed padding. There is nothing in Reidy et al. and Oseroff et al. that teaches or suggests that the thermoplastic rubbers taught in Oseroff et al. are suitable for use in molding a composite steering wheel as taught in Reidy et al. Reidy et al., at column 3, lines 45-67, indicate that a number of thermoplastic materials were tried and proved to be unsuitable for use in molding a composite steering wheel. Reidy et al. then discusses one particular thermoplastic elastomer that was found suitable, *i.e.*, EM 400, and that other thermoplastic elastomers could be used. There is no indication in Reidy et al. what these other thermoplastic elastomers are except for polypropylene, which in and of itself is not a thermoplastic elastomer. Thus, Reidy et al. suggests only that some thermoplastic materials can be used and others cannot.

Oseroff et al. as noted above teaches thermoplastic rubbers that can be used for tapes or grips that can be applied to steering wheels. However, there is nothing in Oseroff et al. that teaches or suggests that these thermoplastic rubbers can be used

in an injection molding process for forming a steering wheel foamed padding material. Accordingly, Oseroff et al. provides no motivation use for using the thermoplastic rubbers taught in Oseroff et al. as a thermoplastic elastomer. At best, Oseroff et al. merely indicate thermoplastic rubbers that one skilled in the art could try in Reidy et al. It well settled though that "obvious to try" is not considered obvious under 35 U.S.C. 103. Thus, it would not be obvious to use the thermoplastic elastomers of Oseroff et al. in the injection molding procedure of Reidy et al.

Additionally, with respect to claims 6 and 14, Reidy et al. in view of Oseroff et al. do not teach a thermoplastic polyolefin elastomer that comprises a mixture of ethylene-propylene copolymer, ethylene-propylene-diene terpolymer, and polypropylene. Reidy et al. do not teach a thermoplastic polyolefin elastomer comprising a mixture of polymers. Similarly, Oseroff et al. only teach that thermoplastic rubber comprises a blend of EPM and polypropylene or EPDM and polypropylene. Thus, claims 6 and 14 are patentable over Reidy et al. in view of Oseroff et al.

35 U.S.C. §103(a) rejection of claims 9, 10, 16, 17, 25, and 26.

Claims 9, 10, 16, 17, 25 and 26 were rejected under 35 U.S.C. §103(a) as being unpatentable over Reidy et al. in view of Braun et al.

Claim 9 is patentable over Reidy et al. in view of Braun et al. because Reidy et al. in view of Braun et al. do not teach a padding material comprising a thermoplastic polyolefin elastomer, wherein the thermoplastic polyolefin elastomer is weatherable and has a durometer shore A hardness of about 30 to about 90. As discussed above with respect to claim 1, Reidy et al. do not teach a padding material comprising a thermoplastic polyolefin elastomer, wherein the thermoplastic polyolefin elastomer is weatherable and has a durometer shore A hardness of about 30 to about 90. Braun et al. teach expand polyolefin granules. Braun et al. do not teach a padding material for a steering wheel comprising a thermoplastic polyolefin elastomer and a gasified chemical foaming agent. Thus, Reidy et al. in view of Braun et al. do not teach or suggest all of the limitations of claim 9; therefore, allowance of claim 9 is respectfully requested.

Claim 10 depends from claim 9 and further recites that the resin carrier is essentially the same material as the thermoplastic polyolefin elastomer. Claim 10 is allowable because of the aforementioned deficiencies discussed above with respect to claim 9 and for the specific limitations recited in claim 9.

Additionally, claim 10 is allowable over Reidy et al. in view of Braun et al. because Reidy et al. Braun et al. do not teach using a resin carrier that is essentially the same material as the thermoplastic polyolefin elastomer. Therefore, withdrawal of the rejection of claim 10 is respectfully requested.

Claims 16 and 25 contain similar limitations to claim 9 and therefore should be allowable for the aforementioned deficiencies discussed above with respect to claim 9 and for the specific limitations recited in claim 16 and 25.

Claims 17 and 26 contains similar limitations to claim 10 and therefore should be allowable for the aforementioned deficiencies discussed above with respect to claim 10 and for the specific limitations recited in claim 17 and 26.

35 U.S.C. §103(a) rejection of claims 29-32, 35 and 37

Claims 29-32, 35 and 37 were rejected under 35 U.S.C. §103 as being unpatentable over Reidy et al. in view of Clarke.

Claim 29 recites a method of manufacturing a steering wheel. In the method, a thermoplastic polyolefin elastomer and a foaming agent are mixed. The mixture of the thermoplastic polyolefin elastomer and the foaming agent are heated to a temperature above the melting temperature of the thermoplastic polyolefin elastomer. The melted thermoplastic polyolefin elastomer is foamed with the foaming agent. A mold is provided having a first wall portion and a second wall portion. The first wall portion defines a first cavity in which a rim portion of a steering wheel armature is disposed. The second wall portion defines a second cavity in which a spoke portion and the steering wheel armature are disposed. The temperature of the first wall portion is maintained at a first temperature below the melting temperature of thermoplastic polyolefin elastomer. The temperature of the second wall portion is maintained at a second temperature. The second temperature is substantially lower than the first temperature. The foamed thermoplastic polyolefin elastomer is transferred into the first cavity and the second cavity. The foamed thermoplastic polyolefin elastomer is cooled to a temperature below the melting temperature of the thermoplastic polyolefin elastomer adhering to the rim portion and spoke portion of the steering wheel armature.

Claim 29 is patentable over Reidy et al. in view of Clarke because Reidy et al. in view of Clarke do not teach or suggest (1) the step of mixing a thermoplastic polyolefin elastomer and a foaming agent and (2) maintaining a first wall portion, which defines a cavity in which the rim of a steering wheel is disposed at a first temperature and maintaining a second wall portion, which defines a cavity in which the spoke portion and steering wheel armature are disposed at second temperature, lower than the first temperature.

As discussed above with respect to claim 1, Reidy et al. do not teach or suggest mixing a thermoplastic polyolefin elastomer and a foaming agent. Reidy et al. only teach mixing a foamed polyester thermoplastic elastomer and a foaming agent. Clarke likewise does not teach mixing a thermoplastic polyolefin elastomer and a foaming agent. Clarke

teaches foaming a polypropylene. Polypropylene is not a thermoplastic polyolefin elastomer. Thus, Reidy et al. in view of Clarke do not teach or suggest mixing a thermoplastic polyolefin elastomer and a foaming agent.

Additionally, Reidy et al. do not teach maintaining wall portions, which define first and second cavities, respectively, for the rim portion and the spoke portion and armature at different temperatures.

As noted in the Office Action, Clarke teaches a mold wall portion can be cooled at different sections to control the degree of foaming. Clarke, however, do not teach maintaining a first wall portion, which defines a cavity in which the rim of a steering wheel is disposed at a first temperature and maintaining a second wall portion, which defines a cavity in which the spoke portion and steering wheel armature are disposed at second temperature, lower than the first temperature. In fact, Clarke mentions nothing on why it would be advantageous to maintain one part of a mold for forming a padding material for a steering wheel at one temperature while maintaining a second part of a mold for forming a padding material at a second temperature. Thus, there is nothing that suggests modifying Reidy et al. in this manner.

Additionally, Clarke provides no motivation modify Reidy to maintain a first wall portion, which defines a cavity in which the rim of a steering wheel is disposed at a first temperature and maintaining a second wall portion, which defines a cavity in which the spoke portion and steering wheel armature are disposed at second temperature, lower than the first temperature. Clarke teaches forming a cup of plastic material not a padding material for a steering wheel.

The Office Action suggests that it would be obvious to provide the mold of Reidy et al. with the cooling ducts of Clarke, in order to ensure the lesser density reduction in the airbag cover of Reidy et al. Assuming arguendo, that this statement is correct, this statement provides no motivation for maintaining the wall portion, which defines the cavity for the rim portion, at a different temperature than the wall portion, which defines the spoke portion. A spoke portion is not an air bag cover.

Thus, Reidy et al. and Clarke do not disclose or suggest maintaining a first wall portion, which defines a cavity in which the rim of a steering wheel is disposed at a first temperature and maintaining a second wall portion, which defines a cavity in which the spoke portion and steering wheel armature are disposed at second temperature, lower than the first temperature.

Therefore, withdrawal of the rejection of claim 29 is respectfully requested.

Claims 30-32, 35, and 37 depend either directly or indirectly from claim 29 and therefore should be allowable because of the aforementioned deficiencies of the rejection.

with respect to claim 29 and for the specific limitations recited in claims 30-33, 35, and 37.

35 U.S.C. §103(a) rejection of claims 33 and 34

Claims 33 and 34 were rejected under 35 U.S.C. §103(a) as being unpatentable over Reidy et al. in view of Clarke and Oseroff et al.

Claims 33 and 34 depend directly from claim 29. As discussed above with respect to claim 29, Reidy et al. in view of Clarke do not teach or suggest the step of maintaining a first wall portion, which defines a cavity in which the rim of a steering wheel is disposed at a first temperature and maintaining a second wall portion, which defines a cavity in which the spoke portion and steering wheel armature are disposed at second temperature, lower than the first temperature. Moreover, Oseroff et al. do not teach or suggest the step of maintaining a first wall portion, which defines a cavity in which the rim of a steering wheel is disposed at a first temperature and maintaining a second wall portion, which defines a cavity in which the spoke portion and steering wheel armature are disposed at second temperature, lower than the first temperature. Therefore claims 33 and 34 should be allowable because of the aforementioned deficiencies of the rejection with respect to claim 29 and for the specific limitations recited in claims 33 and 34 should be allowable.

35 U.S.C. §103(a) rejection of claim 36

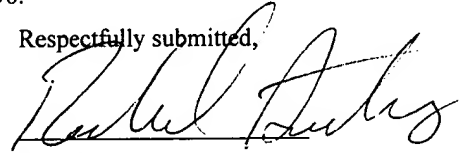
Claim 36 was rejected under 35 U.S.C. §103(a) as being unpatentable over Reidy et al. in view of Clarke and Braun et al.

Claims 36 depends indirectly from claim 29. As discussed above with respect to claim 29, Reidy et al. in view of Clarke do not teach or suggest the step of maintaining a first wall portion, which defines a cavity in which the rim of a steering wheel is disposed at a first temperature and maintaining a second wall portion, which defines a cavity in which the spoke portion and steering wheel armature are disposed at second temperature, lower than the first temperature. Moreover, Braun et al. do not teach or suggest the step of maintaining a first wall portion, which defines a cavity in which the rim of a steering wheel is disposed at a first temperature and maintaining a second wall portion, which defines a cavity in which the spoke portion and steering wheel armature are disposed at second temperature, lower than the first temperature. Therefore, claims 36 should be allowable because of the aforementioned deficiencies of the rejection with respect to claim 29 and for the specific limitations recited in claim 36 should be allowable.

In view of the foregoing, it is respectfully submitted that the above-identified application is in condition for allowance, and allowance of the above-identified application is respectfully requested.

Please charge any deficiency or credit any overpayment in the fees for this amendment to Deposit Account No. 20-0090.

Respectfully submitted,



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